

WHAT IS CLAIMED IS:

1. A transgenic *Neisseria* bacterium comprising a disrupted *pld* gene wherein the bacterium has reduced phospholipase D activity as compared to the phospholipase D activity of a corresponding wild-type *Neisseria*.
2. The bacterium of claim 1, wherein the *pld* gene is disrupted by mutagenesis.
3. The bacterium of claim 2, wherein the mutagenesis is deletion mutagenesis, insertion mutagenesis, substitution mutagenesis, or a combination thereof.
4. The bacterium of claim 1, wherein the bacterium has reduced amounts of phosphatidic acid and choline as compared to a corresponding wild-type *Neisseria*.
5. The bacterium of claim 1, wherein the bacterium has reduced toxicity as compared to a corresponding wild-type *Neisseria*.
6. The bacterium of claim 1, wherein the *pld* gene comprises nucleic acid sequence SEQ ID NO:9, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17 or SEQ ID NO:19.
7. An isolated and purified polynucleotide encoding a PLD from a *Neisseria* bacterium.
8. The polynucleotide of claim 7, wherein the polynucleotide comprises nucleic acid sequence SEQ ID NO:9, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17 or SEQ ID NO:19.
9. An isolated and purified polypeptide encoded by nucleic acid sequence SEQ ID NO:9, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17 or SEQ ID NO:19.
10. An isolated and purified polypeptide comprising phospholipase D from a *Neisseria* bacterium.
11. The polypeptide of claim 10, wherein the polypeptide comprises SEQ ID NO:4, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:18 or SEQ ID NO:20.
12. A vaccine comprising an immunogenic amount of a PLD polypeptide from *Neisseria*, which amount is effective to immunize a patient against a

- neisserial infection, in combination with a physiologically-acceptable, non-toxic vehicle.
- 13. The vaccine of claim 19, which further comprises an effective amount of an immunological adjuvant.
 - 14. The vaccine of claim 19, wherein the polypeptide is conjugated or linked to a second peptide.
 - 15. The vaccine of claim 19, wherein the polypeptide is conjugated or linked to a polysaccharide.
 - 16. The vaccine of claim 19, wherein the polypeptide is encoded by a polynucleotide comprising SEQ ID NO:9, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17 or SEQ ID NO:19.
 - 17. A method of protecting a patient against *Neisseria* colonization or infection comprising administering to the patient an effective amount of a vaccine comprising an immunogenic amount of a PLD polypeptide from *Neisseria*, which amount is effective to immunize a susceptible patient against a neisserial infection, in combination with a physiologically-acceptable, non-toxic vehicle.
 - 18. The method of claim 15, which further comprises an effective amount of an immunological adjuvant.
 - 19. The method of claim 15, wherein the polypeptide is conjugated or linked to a second peptide.
 - 20. The method of claim 15, wherein the polypeptide is conjugated or linked to a polysaccharide.
 - 21. The method of claim 15, wherein the vaccine is administered orally, mucosally or by subcutaneous or intramuscular injection.
 - 22. The method of claim 15, wherein the polypeptide is encoded by a polynucleotide comprising SEQ ID NO:9, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17 or SEQ ID NO:19.

23. A method of preventing infection or colonization of *Neisseria* in a patient by administering to the patient a compound that inhibits neisserial phospholipase D.
24. The method of claim 23, wherein the compound is an anti-neisserial phospholipase D antibody.